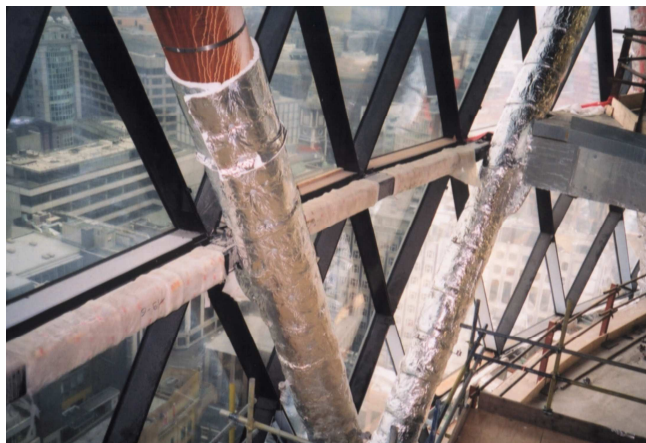


# Building and Structural Steel Systems



**Insulfrax® S Blanket and Durablanket® S Blankets** form an essential element in the fire protection of structural steel columns and beams, achieving up to 240 minutes of fire resistance. These blankets are non-combustible and have been tested in accordance with BS476:Part 4:1970 (1984).

## Insulfrax® & Durablanket S Blanket Details

Insulfrax S Blanket and Durablanket S Blankets are available in a range of densities, thicknesses and roll sizes, as indicated on the product data sheet. The thickness and density chosen depends upon the fire rating required and application, detailed overleaf. The blanket is easily cut with a sharp knife. A straight edge ensures a neat cut. The blanket cartons may be opened out flat to provide a clean working surface

## Installation

One or two layers of blanket are impaled over 3mm diameter welded pins and retained using *speedfix* washers.

The design and pin layout pattern must be in accordance with the tested sections, ie. the pin spacing should be designed to suit the outer layer of blanket. The pins should not be closer than 50 mm to the edge of the blanket on 300 mm centres.

## External Protection

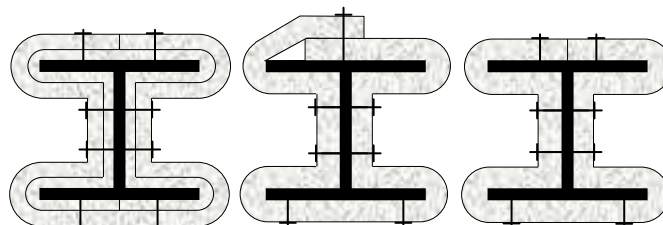
A variety of external finishes can be applied to Insulfrax S Blanket & Durablanket S to give protection against the weather, contamination or mechanical damage. Some finishes, for example aluminium foil, can be applied prior to shipment of the products.

## Single and Multi-layer Systems

The installation of the blanket should be done with the following considerations:

- the *speedfix* washers should not over-compress the blanket
- the blanket should not be stretched across corners of steelwork
- butt joints should be under compression
- traverse and longitudinal joints should be overlapped

## Single and Multi-layer Systems - Installation Types



Type 1

Type 2

Type 3

•Type 1 - multi-layer, butt joint

•Type 2 - single layer, overlap

•Type 3 - single layer, butt joint

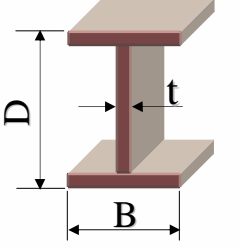
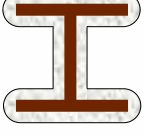
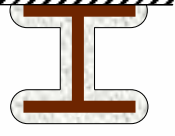
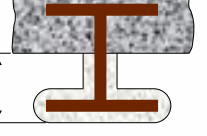

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## Section Factor - $H_p/A$

	<b>4 sides profile</b>  $H_p = 2B + 2D + 2(B - t)$ $\bullet H_p = 4B + 2D - 2t$ $A = (2B \times t) + (D - 2t) \times t$	<b>3 sides profile</b>  $H_p = B + 2D + 2(B - t)$ $\bullet H_p = 3B + 2D - 2t$ $A = (2B \times t) + (D - 2t) \times t$	<b>3 sides profile</b>  Partially exposed $H_p = B + 2d + (B - t)$ $\bullet H_p = 2B + 2d - t$ $A = (2B \times t) + (D - 2t) \times t$	<b>2 sides box</b>  $H_p = B + D$ $A = (2B \times t) + (D - 2t) \times t$
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The concept of the **Section Factor**,  $H_p/A$ , for structural steel members serves as a way to illustrate how quickly a particular section type would increase in temperature when exposed to a fire. **Insulfrax® S Blanket & Durablanket S® Blankets** provide an ideal solution to many structural steel fire protection problems.

### Section Factor, $H_p/A$

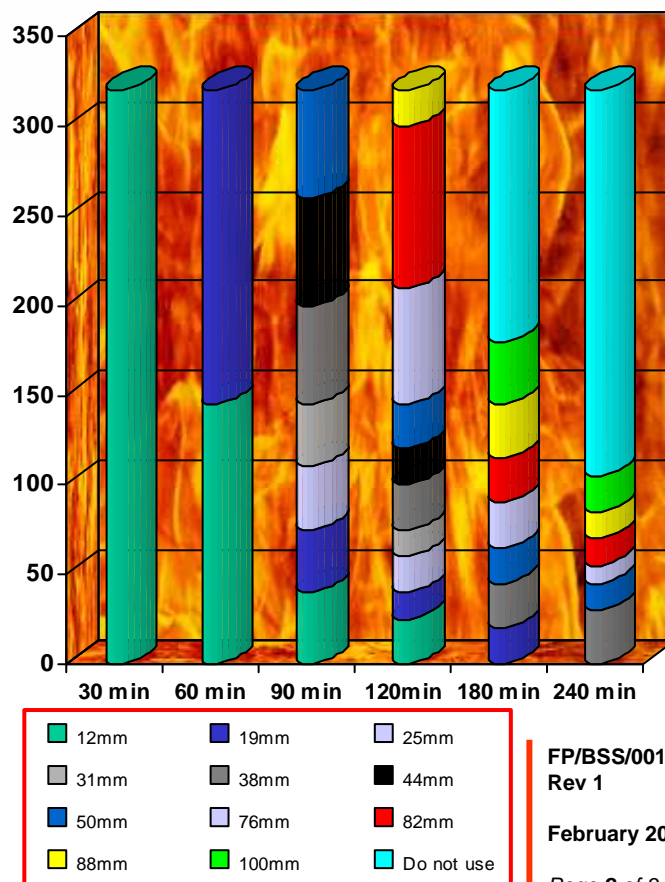
A steel section with a large perimeter ( $H_p$ ) will receive more heat than one with a smaller perimeter. Also, the greater the cross-sectional area ( $A$ ) of the section, the greater the heat sink. It follows that a small thick section will be slower to increase in temperature than a large thin one. Therefore, the higher the value of  $H_p/A$ , the faster the section will heat up in a fire and so require a greater thickness of insulation.

When calculating the  $H_p/A$ , the total cross sectional area  $A$  is used irrespective of the number of exposed sides of the section, as the total mass of steel will be absorbing heat. However,  $H_p$  is the exposed perimeter only and will depend upon the configuration of the fire protection, box or profile wrap, and the position of the steel section relevant to other materials as shown in the examples above.

Insulfrax S Blanket and Durablanket S can be used profile wrap and box style insulation and provides the fire resistance to structural steel members as shown in the table opposite.

The table shows the thickness of blanket needed to achieve the indicated number of minutes fire resistance according to BS476:Part 21:1987.

### Thickness of Insulation for Fire Resistance $H_p/A$ ( $m^{-1}$ )



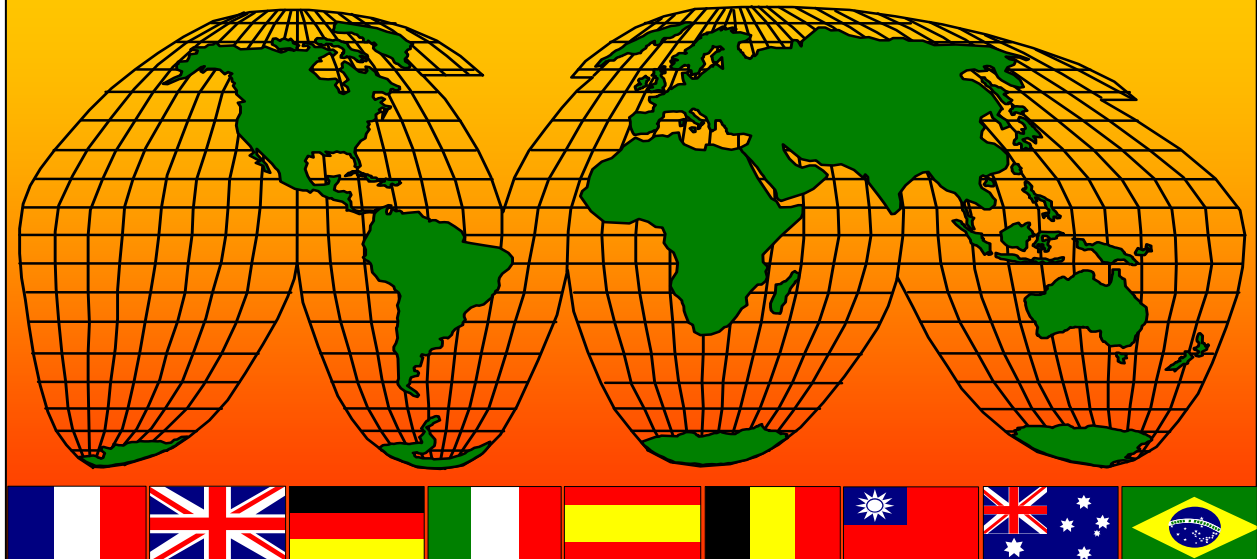
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